

Air Systems Panel Session

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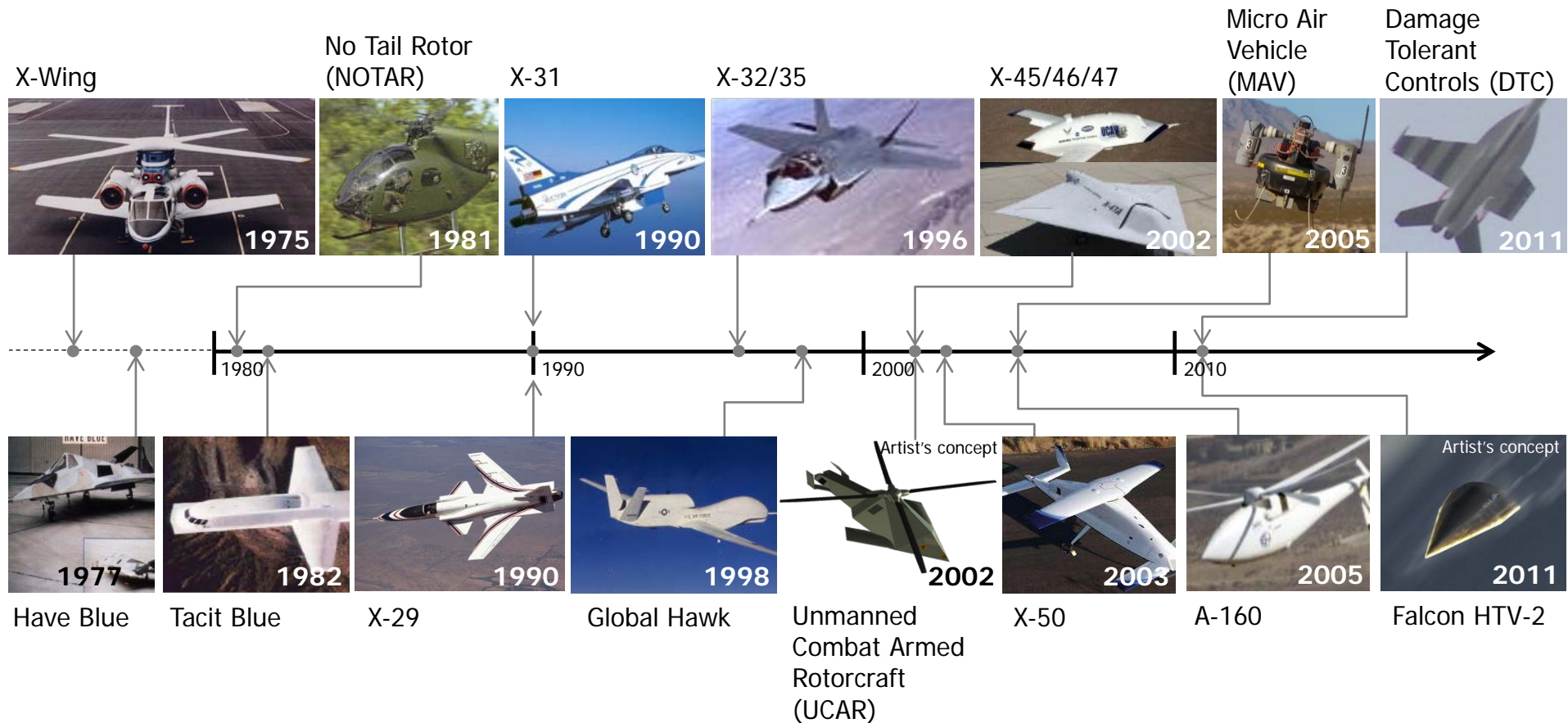
TTO Office Wide BAA Proposers' Day

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Air Systems legacy programs





Air Systems current programs



Hypersonic Technologies



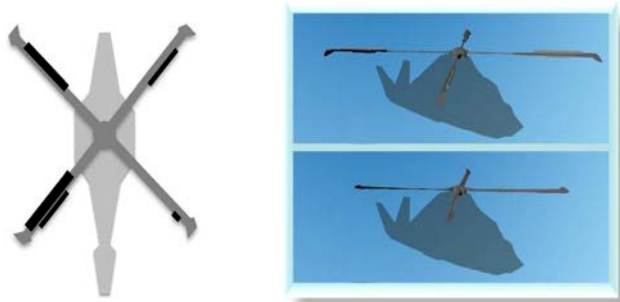
Develop and demonstrate technologies that enable long-range, high-performance maneuvering hypersonic flight; explore vehicle concepts for tactical-range hypersonic cruise missiles and hypersonic boost glide vehicles

Triple Target Terminator (T3)



Range performance and target flexibility for anti-aircraft, anti-cruise missiles, and anti-surface to air radar

Mission Adaptive Rotor (MAR)



Artist's Concepts

Foundational technologies to enable enhanced rotary-wing and VTOL performance capabilities

Transformer (TX)



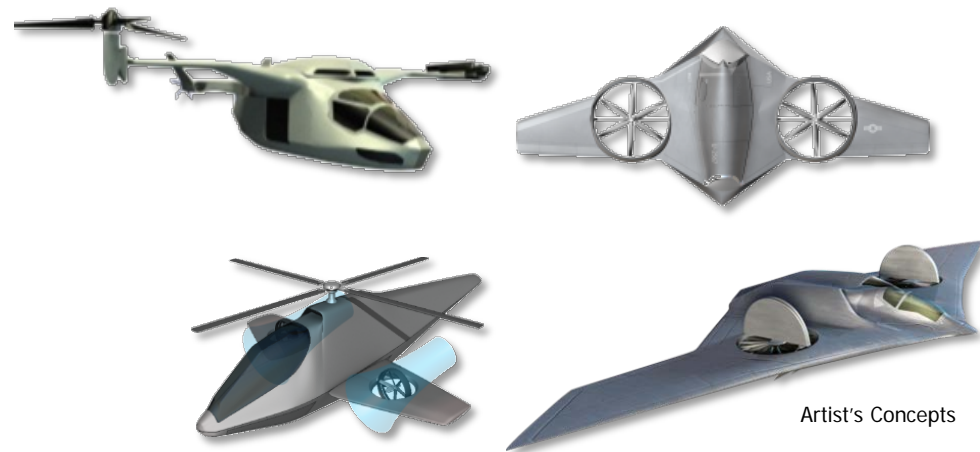
Potential Payload Modules

Artist's Concepts



Modular, versatile, unmanned airlift capability via interchangeable, multi-mission payloads

Vertical Take-off and Landing (VTOL) X-Plane



Artist's Concepts

Transformational vertical flight capabilities applicable to light-medium class aircraft



Objective: Control the air and strike anytime/anywhere

Today's Environment

- Configuration innovations have slowed down
- Lifecycle costs continue to increase
- Performance capabilities have saturated:
 - Human in-the-loop control still necessary
 - Weapon/payload delivery is limited and expensive
 - Propulsion approaches are too homogenous
- Concepts of employment and operations have remained virtually unchanged

Technical Goals

- Experimental aircraft (X-Planes) – demonstrate technologies at relevant scales
- Advanced manufacturing and improved reliability
- Expand performance envelope – endurance, speed, range, payload, survivability:
 - Autonomy
 - High-speed, low-cost precision strike
 - Novel propulsion – hybridization, distribution
- Improved capabilities to enable improved and new missions



Technical goals for hypersonic platforms

- High-performance, robust hypersonic vehicle designs with large operational envelopes
- Lightweight, high-strength hypersonic airframe structures for expendable and reusable vehicles
- Novel materials and design approaches for active and passive thermal protection, able to accommodate high heating for short durations and moderate heating for long durations
- Manufacturing technologies enabling new/novel aerospace materials and agile design for hypersonic vehicle structures, e.g. additive manufacturing
- Adaptive reconfigurable control, real-time trajectory optimization, robust energy management
- Propulsion systems: Scramjets, combined cycle

Technical goals for all novel air vehicles

- Specific technologies to support extreme-range, high-speed, low-cost, long-endurance operations
- New control laws, maneuver and control techniques
- Hybrid and/or distributed propulsion systems
- Flow control, drag reduction
- Multifunctional subsystems
- Advanced test and simulation
- Nontraditional weapon concepts



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